

External factors affecting investment decisions of companies

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Abstract

In this paper, we attempt to investigate the importance of certain external factors on the investment decisions made by Polish companies. With the use of data from the tailor-made *Survey on Receivables*, we (1) examine factors influencing investment decisions of companies in Poland; (2) assess the relation between branch, company size and investment factors; (3) evaluate the importance of the investment factors; and (4) determine the relative influence of these factors on the company-level investment reductions.

The results show that first, although the problem of payment delays is the most important single issue determining the investment decisions of Polish companies, its importance decreases when analysed simultaneously with other issues. Second, among the indicators selected for an assessment of investment decisions, two driving forces determine the investment decisions of Polish companies - namely, macroeconomic factors and law-related factors, with the relative importance of the former lower than the latter. Third, there is a positive association between the importance of each of the two factors and the actual investment reductions, implying that among companies facing higher investment reductions, the importance of macroeconomic and law-related factors is higher.

Keywords: investment decisions, company, survey, structural equation modelling

JEL: D92 G11 G31

1. INTRODUCTION

Investment decisions are crucial for the performance of the economy twofold, i.e., with respect to both macro and micro perspectives. From the macro perspective, in a regular business cycle, they account for the majority of the volatility in the Gross Domestic Product (GDP) dynamics, and their magnitude serves as a significant leading indicator of economic performance (Zarnowitz 1992). From the micro perspective, they are crucial for the growth of individual companies, increasing their efficiency by reducing unit costs.

The research aiming at investigating the process of investment decision at the company's level has generally shown that it is a multi-criteria process (Enoma and Mustapha 2010) taking into account numerous factors. These factors include not only economic and risk factors but also the political and social environment and government regulations (Enoma and Mustapha 2010). Naturally, the effects of these factors on the decisions of individual companies vary significantly. In general, all investors appreciate transparency of information and trustworthiness in a country or in a market. They are afraid of risk factors such as market uncertainty, lack of market knowledge and lack of investment experience (Kahraman 2011; Trappey et al. 2007), which are likely to make firms underinvest (Liu and Pang 2009; Volker et al. 2009).

Because of the importance of proper investment behaviour on the company's performance and growth opportunities, many attempts have been made in the literature to describe and assess it. These studies have generally shown that financial factors are more important with regard to the investment process for smaller firms (Carr et al. 2010; Fazzari, et al. 1998; Liu and Pang 2009). Because they have limited access to capital markets, they are forced to rely more on internal funds such as, for example, personal savings or funds borrowed from relatives or friends (Gill et al. 2012). Furthermore, to meet these needs and to assess the risk of investment, they apply different types of financial bootstrapping methods (Ekanem 2005; Winborg and Landstrom 2000). Large companies, on the other hand, have better access to external funding (collateral, credit, etc.) and, for the investment appraisal, use more formal methods such as capital budgeting (Laux 2008; Sandahl and Sjogren 2003; Verbeeten 2006).

Having said so, we want to note that in order to make the investment process work, the investment needs to be implemented along with the needs of companies and comply with the firm's ability to absorb them (Nelson 2005). However, what happens very often is that

companies are ready to invest (and absorb a new technology), but due to external factors, their investment activity is reduced. In our opinion, the most important and commonly acknowledged external factors influencing, and thus likely impeding, investment decisions are those that relate to macroeconomic prospects and monetary policy conducted in a country, which are manifested in expected GDP growth and interest rates (Karima and Azman-Sainib 2012). Their role is so widespread that it might be assumed that they influence all companies in their investment decisions. Other important factors that strongly affect the investment possibilities are liquidity and the pattern of debt repayment observed among the companies in the economy. If companies suffer from delays in obtaining their receivables, then their costs are likely to increase and new investment projects might be reduced to a large extent (compare Bialowolski and Prochniak 2013). Then, investment actions are usually influenced by external decisions associated with government performance. Among those, the most important is tax policy, which directly influences the rate of return on an investment (Alam and Stafford 1985; Hodgkinson 1989; Morgan 1987, 1992; Overesch and Wamser 2010; Santoro and Wei 2012). However, it has been shown that external factors are more important for large firms than for small ones (Alam and Stafford 1985) and in the case of the latter they might not even be considered in the investment decision process (Hodgkinson 1989). Furthermore, the rate of return can be influenced by the performance of institutions in the country, though not explicitly (Child and Yuan 1996; Nelson 2005). Finally, investment decisions can be influenced by barriers that might be due to the state of current regulations in a country (Ozorio et al. 2013) or in the European Union (Volker et al. 2009), which are very visible in the area of environmental protection (Laurikka and Koljonen 2006).

Economic literature has identified numerous approaches that have been implemented in order to assess what factors influence the investment decisions and to what extent. They were based on survey data (Bond et al. 2003; Enoma and Mustapha 2010; Gill et al. 2012; Karima and Azman-Sainib 2012; Masini and Menichetti 2013; Morgan 1987, 1992; Newell and Seabrook 2006), annual accounts data (Liu and Pang 2009), personal interviews (Ekanem 2005; Newell and Seabrook 2006) and direct observation (Ekanem 2005). The methods used comprise a dynamic neoclassical investment function based on system of generalised method of moments estimations (Karima and Azman-Sainib 2012; Liu and Pang 2009), principal component analysis (Enoma and Mustapha 2010; Gill et al. 2012; Masini and Menichetti 2013; Tsado and Gunu 2011), multi-criteria decision-making procedure of the analytic

hierarchy process (Newell and Seabrook 2006), and econometric analysis (Hogan and Lewis 2005; Masini and Menichetti 2013), to name only a few.

The increasing interest in research aiming at investigating the importance of external factors influencing the investment decisions of companies gives rise to the question about what this process is like among Polish firms. This was especially important in 2011, when more than two-thirds of Polish companies reduced their investments. To this aim, a tailor-made survey designed to measure the impact of overdue receivables on the functioning of Polish enterprises, namely, *Survey on Receivables*, was worked out¹. With the use of the survey, we (1) evaluate the importance of different external factors influencing investment decisions of companies in Poland, (2) assess whether branch and company size matter for the level of importance and (3) investigate the relative influence of these factors on actual investment reductions.

This study adds to the current literature on the investment decision process among firms in four ways. First, this study is the first to present the scale of investment reductions in Poland and its relation to economic, political, institutional, legal and environment-related factors. Second, the study provides for the classification of factors responsible for investments in companies, showing that two driving forces can be distinguished: (1) the impact of the macroeconomic situation on investment decisions and (2) the impact of the legal environment on investment decisions. Third, this research shows which branches are affected most by investment reduction with respect to the importance of the macroeconomic situation and legal barriers. Finally, it delimits the relation between the importance of macroeconomic and legal factors and actual investment reductions at the company level.

The remainder of the paper is organised as follows. In the following section, the data used and the methods applied are succinctly presented. Then in the Results section, first, the importance of different external factors influencing investment decisions of companies in Poland, based on simple descriptive statistics, are shown and interpreted. Then, the outcomes of an exploratory approach, followed by those of a confirmatory approach aimed at assessing their importance are presented. Finally, the relative influence of these factors on actual investment reductions is indicated. The key findings are summarised, limitations of the research are noted, and possibilities for future research are presented in the Discussion section.

¹ For description of the survey questionnaire, see (Bialowolski and Prochniak 2013). The Survey has been conducted as a joint research project of the Conference of Financial Enterprises in Poland and The National Debt Register.

2. DATA AND METHODS

Our study is based on individual survey data from a set of special questions composed in the *Survey on Receivables*. The *Survey on Receivables* was launched in Poland in January 2009 to measure the impact of overdue receivables on the functioning of Polish enterprises. It has been conducted on a quarterly basis with an average of 1859 responses gathered each quarter. The sample of firms is weighted with respect to the region (NUTS1) and branch. A set of questions concerning the factors affecting investment decisions of companies was asked twice: in October 2011 and in January 2012 (detailed wording of questions is presented in Appendix 1).

To determine which external factors influence the investment decisions of companies, we first apply an exploratory factor analysis (Brown 2006; Hurley et al. 1997) in order to investigate whether the statements describing reasons influencing the investment decisions of Polish companies are driven by common factors. Having confirmed it by means of confirmatory factor analysis (Brown 2006), we then develop a structural equation model (Bielby and Hauser 1977; Jackson et al. 2009; Kline 2011; Saris et al. 2009) oriented to establishing the factors responsible for the investment decisions of enterprises according to company size and branch and to investigating the relation between these factors and actual investment reductions at the company level.

To assess the model fit, we use the set of commonly accepted measures: Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI). With respect to RMSEA, commonly accepted values should be within the range of 0.00-0.08 (Browne and Cudeck 1992). With respect to CFI and TLI, it is usually assumed that these statistics should be above 0.9 or 0.95 in order to judge the model as acceptable (Hu and Bentler 1999).

All analyses are run using Mplus 6.1 (Muthén and Muthén 2012). Due to the categorical character of items, in the estimation procedure, the robust weighted least squares estimator is used. This is a default estimator in the analysis using categorical indicators in Mplus (Muthén and Muthén 2012). Sampling weights are also taken into account in the analyses.

3. RESULTS

3.1 DESCRIPTIVE STATISTICS

Before the common driving forces in the investment decisions determinants can be detected, the importance of each of the statements is subject to the analysis. The results are presented in Table 1.

Table 1: Investment reductions among Polish companies

Has your company been reducing investments?	Yes, to a very high degree (reduction by over 50% with respect to the optimum state)	Yes, to a high degree (reduction 21-50% with respect to the optimum state)	Yes, to a medium degree (reduction 11-20% with respect to the optimum state)	Yes, but to a very limited degree (reduction by up to 10% with respect to the optimum state)	No, it has not been reducing investments
Overall	11.7%	11.7%	18.6%	25.1%	33.0%
Branch					
Agriculture	11.0%	9.8%	25.6%	19.5%	34.1%
Manufacturing	10.1%	9.5%	17.9%	24.8%	37.8%
Construction	14.5%	16.2%	23.1%	20.5%	25.6%
Trade	10.9%	10.1%	20.3%	27.1%	31.6%
Financial services	7.9%	2.2%	11.2%	25.8%	52.8%
Telecommunications	5.1%	15.4%	20.5%	30.8%	28.2%
Other services	13.5%	14.3%	17.5%	25.1%	29.6%
Size					
Up to 9 employees	13.9%	15.2%	21.5%	25.9%	23.4%
10-49 employees	11.4%	10.4%	18.6%	22.6%	37.0%
50-249 employees	7.0%	5.5%	11.7%	27.0%	48.8%
250+ employees	3.2%	3.2%	7.4%	29.8%	56.4%

Source: Data from Survey on Receivables. Own calculations. N=1964

In 2011, more than two-thirds of Polish companies were forced to make investment reductions. The largest group suffered from minor investment reductions (up to 10%), but there was a group comprising 11.7% of companies in the whole economy that had to reduce its investment activity by over a half. The problem was not, however, spread equally among companies regarding their size and branch. Larger firms were much less exposed to investment reductions. Within branches, the largest share of firms facing major investment reductions was found in the construction sector, while the lowest impact was reported in financial services. Having that in mind, an investigation into the reasons that either favour or hinder investment activity, with respect to the enterprise's size and branch, was of natural interest. Therefore, with the set of seven statements referring to the importance of different factors for investment decisions, an initial overview of the situation among Polish companies is presented in Table 2.

Table 2: Average importance of different factors in investment decisions of Polish companies

Has your company been reducing investments?	Growth rate forecasts	Interest rates	Payment delays	Tax policy	Legal barriers	Trust in institutions (government)	Need to meet the environmental regulations
Overall	2.92	3.13	2.46	2.55	2.72	2.79	3.19
Branch							
Agriculture	3.10	3.40	2.49	2.55	2.11	2.71	2.49
Manufacturing	2.97	3.20	2.50	2.62	2.71	2.81	2.96
Construction	2.75	3.03	2.17	2.36	2.52	2.57	3.10
Trade	2.87	3.05	2.41	2.51	2.75	2.83	3.29
Financial services	2.90	2.62	2.70	2.56	2.82	2.85	3.94
Telecommunications	3.17	3.05	2.41	2.79	2.98	2.89	3.78
Other services	2.91	3.18	2.47	2.55	2.79	2.79	3.24
Size							
Up to 9 employees	2.95	3.25	2.42	2.51	2.73	2.70	3.35
10-49 employees	2.92	3.02	2.37	2.51	2.69	2.86	3.11
50-249 employees	2.74	3.03	2.65	2.77	2.75	2.87	2.90
250+ employees	3.04	2.97	3.02	2.75	2.77	3.05	2.83
Source: Data from Survey on Receivables. Own calculations. N=1965							
*(1 = very high importance, 3 = medium importance, 5 = very low importance)							

Polish companies declared that in 2011, the most important element of the investment decision process was payment delays. Less influential, but still important for investment actions, were factors associated with governmental policy – namely, taxes, trust and legal barriers. Quite surprisingly, prospects of growth ranked fifth. The least important two factors were interest rates and environmental regulations. There were again, however, significant discrepancies between branches and companies regarding their size. Payment delays gained even more importance for construction companies, but were also the most important investment decision factors for companies from manufacturing, trade, and telecommunications sectors, and from other services as well as for small- and medium-sized companies (up to 249 employees). Interest rates were among the key factors for financial services but, concurrently, were of very minor importance to small- and medium-sized companies. This observation seems to be in slight contrast to the results of Karima and Azman-Sainib (2013), who indicate that small firms are more responsive to monetary tightening when compared to large firms. The largest differences between different types of companies were present with respect to the importance of environmental regulations. They seem to be one of the key investment factors for companies operating in agricultural sector, while for companies in financial or telecommunications business, they are of very low importance.

3.2 EXPLORATORY MODELS

Although we were able to find considerable differences in the perception of different factors in the investment decision process between companies, we searched for common driving forces responsible for patterns of responses with respect to the importance of specific factors in the financial decision process. To find them, an exploratory factor analysis was first employed and then the structural model was proposed. It means that in the first step, under an exploratory factor analytical framework, we compared the results of one, two and three factor solutions (Table 3).

Table 3: Factor loadings and fit indices in exploratory factor analysis with one, two and three factor solutions

	One-factor solution	Two-factor solution		Three-factor solution		
	Factor1	Factor1	Factor2	Factor1	Factor2	Factor3
INV1	0.544	0.712	-0.010	0.776	-0.016	-0.039
INV2	0.569	0.723	0.009	0.669	0.018	0.040
INV3	0.478	0.342	0.198	0.302	0.141	0.117
INV4	0.752	0.247	0.555	0.001	1.158	0.000
INV5	0.719	0.004	0.748	-0.040	0.003	0.833
INV6	0.741	-0.040	0.820	0.007	0.137	0.650
INV7	0.518	0.029	0.514	0.042	-0.040	0.558
factor correlations						
(1-2)	N.A.		0.633		0.500	
(1-3)	N.A.		N.A.		0.618	
(2-3)	N.A.		N.A.		0.555	
RMSEA	0.082		0.049		0.021	
CFI	0.900		0.980		0.999	
TLI	0.850		0.947		0.990	

Source: Data from Survey on Receivables. Own calculations in Mplus. N=1965

The results depict that a one-factor solution is clearly not acceptable. All the fit indices are not within the accepted boundaries. Nevertheless, a two-factor solution seems to be the first acceptable one. Before it can be further analysed, it needs to be checked in a confirmatory factor analysis model. The check is performed with a specification where small factor loadings (i.e., in our case below 0.1) are constrained to zero (Table 4).

Table 4: Standardised factor loadings and fit indices in confirmatory factor analysis model with two factors

	Two-factor solution	
	Factor1	Factor2
INV1	0.700	---
INV2	0.732	---
INV3	0.346	0.195
INV4	0.262	0.543
INV5	---	0.758
INV6	---	0.787
INV7	---	0.538
factor correlations	0.625	
RMSEA	0.039	
CFI	0.982	
TLI	0.966	

Source: Data from Survey on Receivables. Own calculations in Mplus. N=1965

The fit indices of the two-factor model, which was run under a confirmatory factor analysis framework, confirm that the model is well fitted. The pattern of factor loadings clearly shows that the first factor is associated to the highest extent with the macroeconomic environment and reflects the importance of growth prospects and interest rates in the investment decision process. The second factor is mostly associated with the legal environment, which is represented in factor loadings related to the importance of legal barriers and trust towards institutions. The second factor is also responsible for explaining the importance of tax policy and barriers associated with the environmental regulations. By and large, it seems that although the problem of payment delays is the most important single reason determining the investment decisions of Polish companies, it also has the lowest communality with other reasons. This analysis, then, implies that the problem of payment delays is firm-specific and, when analysed simultaneously with other reasons, seems to poorly correspond both to the dimension of macroeconomic environment (Factor 1) and to legal environment (Factor2).

3.3 STRUCTURAL MODEL

The next step of the analysis is oriented on presenting companies' characteristics that might influence the perception of importance of the macroeconomic environment and those associated with the legal environment. To determine the influence, the information of the company's employment and branch are used as explanatory variables in the structural equation model with two previously determined factors. The significance of the explanatory

variables is determined according to the backward elimination procedure, the final results of which are presented in Table 5.

The analysis shows that with regard to the size of a company, factors related to the macroeconomic environment are more important for small companies (10-49 employees) than for their smaller (microfirms) and larger (medium and large) counterparts. This finding might suggest that small companies are more exposed to the macroeconomic environment in their investment decisions than other firms. Furthermore, decision-making factors related to the legal environment are of the same importance for all companies regardless of their size. Referring to the branch, we can conclude as follows. First, companies from the construction sector are more cautious and consider both the macroeconomic environment and the legal environment as more important than do their counterparts from the “other services” sector. Second, trade companies and financial services companies are significantly more preoccupied with the macroeconomic environment in their investment decision process, whereas agricultural companies tend to pay more attention to the legal barriers in their investment decision process, which confirms the findings presented in Table 2, showing that environmental issues are very important for agricultural companies. Third, among the companies from all branches, the financial services companies reflect the largest influence of macroeconomic factors on the investment decision process, and the agricultural companies reflect the largest influence of legal factors on the investment decision process.

Table 5: Standardised factor loadings, influence of branch, company size and fit indices in the structural equation model

	Two factor solution	
	Factor1	Factor2
INV1	0.689	---
INV2	0.743	---
INV3	0.343	0.198
INV4	0.270	0.535
INV5	---	0.763
INV6	---	0.782
INV7	---	0.545
up to 9 employees		Ref.
10 to 49 employees	-0.134	---
Other services		Ref.
Agriculture	---	-0.537
Construction	-0.248	-0.261
Trade	-0.159	---
Financial services	-0.452	---
factor correlations		0.639
RMSEA		0.037
CFI		0.957
TLI		0.939

Source: Data from Survey on Receivables. Own calculations in Mplus. N=1964

* categories insignificant and excluded from the analysis:
1. size: 50 to 249 employees and more than 249 employees;
2. branch: manufacturing, telecommunications.

The final step of our analysis is to investigate the relative influence of factors associated with the macroeconomic and legal environment on investment reductions. To do this, we extended the model by introducing the question about the magnitude of the investment reduction (Figure 1).

Figure 1: Final structural equation model for investment reductions

the legal environment are more likely to face investment reductions. The relative importance of the reasons related to the legal environment is much higher than the relative importance of the macroeconomic reasons. It is confirmed by the standardised coefficient being over two times higher in the latter case (0.199 vs. 0.098). The factor scores and regression coefficients of variables related to the company's size and the branch remain essentially the same as in the model without investment reduction variable.

Additionally, to check the robustness of our results with respect to the macroeconomic factors (interest rates and GDP growth), we investigated their importance with respect to investment decisions on the macro level⁴. We found that GDP growth rates are significantly related to the investment decisions of companies, which is confirmed by the very high correlation coefficient for contemporaneous GDP growth rate and investment growth - 0.83. Interest rates also significantly (but negatively) correlate with investment growth rates both uncontrolled and controlled for the GDP growth. The correlation coefficient between the investment growth and interest rates amounts to -0.46 for interest rates leading investment growth by five quarters. These results imply that the relationship between the interest rates and investment decisions of companies we spotted on the micro level also transfers to the relation on aggregates.

4. DISCUSSION

In this paper, we attempted to investigate the importance of certain external factors on the investment decisions of Polish companies. With the use of data from the tailor-made *Survey on Receivables*, we investigated importance of different external factors influencing investment decisions of companies in Poland, assessed the relation between the branch and company size and importance of the factors, and finally, we determined the relative influence of these factors on the actual investment reductions.

To the best of our knowledge, this study is the first attempt of such research for the Polish economy. Although the research is limited to one country only, it benefits from the experience of others gathering all reasonable and applicable to Polish conditions solutions. In general, the results showed that first, although the problem of payment delays is the most important single reason determining the investment decisions of Polish companies, its importance decreases when analysed simultaneously with other reasons. Second, there are two

⁴ We decided not to make a similar attempt with respect to the legal factors because it is very hard to establish macro-level indicators of legal barriers due to their qualitative character.

driving forces determining the investment decisions of Polish companies - namely, macroeconomic factors and law-related factors with the relative importance of the former lower than the latter. Third, there is a positive association between the importance attached to factors influencing investment decisions associated with macroeconomic and legal environment and the investment reductions, meaning that companies facing higher investment reductions are also more prone to notice and value the factors influencing these decisions.

Though the research has largely been exploratory in nature, the validity of these findings was confirmed. The analyses were repeated on an independent data set coming from the survey carried out in the following quarter. The results, despite different with respect to numbers, were the same with regard to interpretation. The inter-temporal changes were not, however, investigated because the timespan between two measurement occasions were not sufficient to record any changes in the opinions.

Despite these advances, the research also has some limitations. The major limitation relates to ability in providing reliable data on investment decisions especially in a form of a questionnaire (Morgan 1992). However, we are convinced that taking into regards both pros and cons, the process of data gathering by means of the survey ensured the best possible results with regard to the aim of a research.

Second, the questionnaire used to gather data was developed relying largely on the available empirical research on investment decision process. Although this research has developed in recent years and has applied increasingly sophisticated data and methods, it is still far from perfect. Above all, the results presented are so strongly linked to the organisational form, size and branch a company operates in that they often prevented us from obtaining more general and universal conclusions.

Acknowledgments

The contribution of Piotr Bialowolski in this project was financed by the research grant of the Polish National Centre of Science (grant no. UMO-2011/01/D/HS4/04051).

The authors would like to thank to Mariusz Prochniak, Catalin Dragomirescu-Gaina and the anonymous reviewer for their comments to the paper.

APPENDIX

Set of questions related to the investment decisions of companies.

Question number and code	Question wording	Answer categories (representing also scale points)
INV_RED	Has your company been reducing the investments?	1.0 "Yes, to a very high degree (reduction by over 50% with respect to the optimum state)" 2.0 "Yes, to a high degree (reduction 21-50% with respect to the optimum state)" 3.0 "Yes, to a medium degree (reduction 11-20% with respect to the optimum state)" 4.0 "Yes, but to a very limited degree (reduction by up to 10% with respect to the optimum state)" 5.0 "No, it has not been reducing investments"
INV1	What is the importance of growth rate forecasts for the investment decisions of your company?	1.0 "very high" 2.0 "high" 3.0 "medium" 4.0 "low" 5.0 "very low"
INV2	What is the importance of interest rates for the investment decisions of your company?	1.0 "very high" 2.0 "high" 3.0 "medium" 4.0 "low" 5.0 "very low"
INV3	What is the importance of the existence of payment delays for the investment decisions of your company?	1.0 "very high" 2.0 "high" 3.0 "medium" 4.0 "low" 5.0 "very low"
INV4	What is the importance of the tax policy for the investment decisions of your company?	1.0 "very high" 2.0 "high" 3.0 "medium" 4.0 "low" 5.0 "very low"
INV5	What is the importance of legal barriers impeding investment start for the investment decisions of your company?	1.0 "very high" 2.0 "high" 3.0 "medium" 4.0 "low" 5.0 "very low"
INV6	What is the importance of trust in institutions (government) for the investment decisions of your company?	1.0 "very high" 2.0 "high" 3.0 "medium" 4.0 "low" 5.0 "very low"
INV7	What is the importance of a need to meet the environmental regulations for the investment decisions of your company?	1.0 "very high" 2.0 "high" 3.0 "medium" 4.0 "low" 5.0 "very low"

Source: Survey on Receivables conducted by Conference of Financial Enterprises in Poland and National Debt Register. Author of the questionnaire: Piotr Białowolski

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